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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/540,659 | 06/23/2005 | Koji Moriuchi | 10873.1716USWO | 5389 |
| 52835 7590 01/22/2008 HAMRE, SCHUMANN, MUELLER & LARSON, P.C. P.O. BOX 2902 MINNEAPOLIS, MN 55402-0902 | | | | |
| EXAMINER | | | | |
| FREEMAN, JOHN D | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 4174 | | | | |
| MAIL DATE | | DELIVERY MODE | | |
| 01/22/2008 | | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/540,659

Applicant(s)

MORIUCHI ET AL.

Examiner

John Freeman

Art Unit

4174

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 9/05, 8/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

1. Claims 1-17 are objected to because of the following informalities: the amended set of claims filed on June 23, 2005 have incorrect status identifiers, and show incorrect markings identifying changes. It appears Applicant amended the claims twice while the application was in the international stage. However, upon entering the national stage, Applicant only provided two sets of claims, one of which is the original international filing, and the other is the second amendment. As such, the status identifiers and markings do not match because of the "missing" intervening amendment. The examiner suggests that the applicants supply a new set of claims, canceling the old claims and start the numbering from the

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 1 and 3-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Peterson et al. (4670342).

4. Peterson et al. (hereafter Peterson) disclose polyimide precursors.

5. Regarding claims 1 and 3:

6. Example 18 (col 14) contains the following compounds which correspond to

Applicant's compound:

| Applicant's Claim | Tetracarboxylic dianhydride | Diamine | Polar Solvent | Cyclic Compound |
|------------------------------|--|----------------|----------------------|----------------------------|
| Peterson | BPADA | MDA | MMP* | PC |

7. The abbreviations are defined on col 3 ln 55+:

| Abbreviation | Chemical Name |
|---------------------|---|
| BPADA | 2,2-bis[4-(dicarboxyphenoxy) phenyl]propane dianhydride |
| MDA | p,p'-methylenedianiline |
| MMP* | N-methyl-2-pyrrolidone |
| PC | propylene carbonate |

*(appears to be a typographical error for NMP)

8. Regarding claims 4 and 5:

9. As Applicant discloses propylene carbonate as a suitable cyclic compound for the present invention, the examiner takes the position that PC inherently possesses a dielectric constant and dipole moment falling within Applicant's ranges.

10. Regarding claim 6:

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11. Peterson's Example 18 follows Applicant's proportions. After preparing the precursor, the solution was 24% solids (col 15 In 22). The weights of all compounds (A-F) listed sums to 2327g. This implies 582g of solids in the precursor. The following table compares the solvent (A and F), and cyclic compound (D) weights:

| | Weight (g) | Mass Parts |
|---------|------------|------------|
| solids | 582 | 100 |
| solvent | 1235 | 212 |
| cyclic | 423 | 72.7 |

12. Regarding claim 7:

13. The examiner takes the position that a precursor made in the manner of Peterson would have similar properties as one, wherein the polyimide is polymerized before the cyclic compound is added.

14. Claims 1-5, 7-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishikawa et al. (JP 2001-264771).

15. Nishikawa et al. (hereafter Nishikawa) disclose a polyimide precursor having tetracarboxylic dianhydride, diamine, γ -butyrolactone, and N-methyl-2-pyrrolidone [0004].

16. Regarding claims 1 and 2:

17. The tetracarboxylic acid can include those conforming to Applicant's formulae A and B [0005]. For example 3,3',4,4'-biphenyl tetracarboxylic dianhydride corresponds to Applicant's A.

18. Also, 4,4'-bis(3,4-dicarboxy phenoxy)diphenyl sulfide dianhydride, 4,4'-bis(3,4-dicarboxy phenoxy)diphenyl propane dianhydride, correspond to Applicant's B. The

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latter corresponds to BPADA, even though it does not follow the traditional naming/numbering system of BPADA: 2,2-bis[4-(dicarboxyphenoxy) phenyl]propane dianhydride.

19. Regarding claim 3:

20. The diamine can be, for example, diamino diphenyl sulfide or 4,4'-diamino diphenyl ether [0007].

21. Regarding claims 4 and 5:

22. As Applicant discloses γ -butyrolactone as a suitable cyclic compound for the present invention, the examiner takes the position that it inherently possesses a dielectric constant and dipole moment falling within Applicant's ranges.

23. Regarding claim 7:

24. The examiner takes the position that a precursor made in the manner of Peterson would have similar properties as one, wherein the polyimide is polymerized before the cyclic compound is added.

25. Regarding claims 8-11 and 17:

26. Nishikawa creates a film of the polyimide on a substrate [0034]. The examiner takes the position that the polyimide would possess inherently the transmittance value under the prescribed conditions as claimed. The examiner also takes the position the polyimide would inherently have the glass transition temperature and low water absorption as claimed.

27. Regarding claims 12 and 13:

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28. The film is placed on a transparent, conductive film [0021]. The conductive film can be made of indium-tin oxide (ITO) [0023]. Applicant discloses that indium-tin oxide would have a resistance as claimed (p12 ln27).

29. Regarding claims 14-16:

30. Nishikawa creates a film on the transparent electrode (indium-tin oxide) side of a glass substrate [0034].

31. Claims 1-5 and 7-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Rushkin et al. (2004/0161619).

32. Regarding claims 1-3:

33. Rushkin et al. (hereafter Rushkin) disclose a polyimide precursor composition [0013]. A mixture of dianhydrides can be used [0031]. Examples of suitable dianhydrides include 3,3',4,4'-biphenyltetracarboxylic acid dianhydride and 2,2-bis(3,4-dicarboxyphenyl)propane dianhydride [0031]. Diamines can conform to formula VII, which overlaps with Applicants formula I [0034].

34. The composition comprises γ -butyrolactone and polar solvents such as other lactones [0040].

35. Regarding claims 4 and 5:

36. As Applicant discloses γ -butyrolactone as a suitable cyclic compound for the present invention, the examiner takes the position that it inherently possesses a dielectric constant and dipole moment falling within Applicant's ranges.

37. Regarding claim 7:

38. The examiner takes the position that a precursor made in the manner of Peterson would have similar properties as one, wherein the polyimide is polymerized before the cyclic compound is added.

39. Regarding claims 8-10 and 17:

40. Rushkin coats a substrate with the precursor [0044]. The thickness of the coating is about 50 micrometers [0045]. The precursor is later cured to a polyimide at its glass transition temperature or higher [0065]. The temperature ranges from 200°-500°C, implying the polyimide coating inherently has a transition temperature above 200°C.

41. Regarding claim 11:

42. The examiner takes the position that the polyimide coating of Rushkin inherently possesses such low water absorption properties, as the polyimide is the same as Applicant's.

43. Regarding claims 12 and 13:

44. Suitable substrates includes indium-tin oxide [0023]. This corresponds to Applicant's transparent, electrically conductive film. Applicant discloses that indium-tin oxide would have a resistance as claimed (p12 ln27).

45. Regarding claims 14-16:

46. The polyimide is coated with a Deep UV photoresist layer [0046]. Such a layer is transparent. Therefore, the indium-tin oxide is on one side of a transparent film (with the polyimide layer in between).

Claim Rejections - 35 USC § 112

47. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

48. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

49. Applicant attempts to claim a polyimide precursor in a product-by-process manner. However, the product cannot be made by the process as written. Applicant attempts to claim a polyimide precursor that is already polymerized, i.e. no longer a precursor. Therefore, it is unclear what Applicant is trying to claim.

50. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

51. Applicant does not indicate if the water absorption value is percent-by-weight, percent-by-volume, or some other metric.

Conclusion

The examiner notes that other references cited on the international search report are related, but not directly pertinent at this time.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Freeman whose telephone number is (571)270-3469. The examiner can normally be reached on Monday-Friday 7:30-5:00PM EST (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571)272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Primary Examiner, Art Unit 4174

John Freeman
Examiner
Art Unit 4174

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Examiner, Art Unit 4174